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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/980,311	02/07/2002	Noriaki Takaichi	2001-1772A	9880

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EXAMINER

MCLEAN MAYO, KIMBERLY N

ART UNIT	PAPER NUMBER
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2187

DATE MAILED: 04/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/980,311

Applicant(s)

TAKAICHI, NORIAKI

Examiner

Kimberly N. McLean-Mayo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2001.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-3,6-9,11-15,18,26 and 30 is/are rejected.
7) ☒ Claim(s) 4,5,10,11,16,17,19-21,23-25 and 27-29 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 21 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

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DETAILED ACTION

1. The enclosed detailed action is in response to the Information Disclosure Statement, Declaration and Preliminary Amendment submitted on February 7, 2002 and the Application submitted on November 30, 2001.

Information Disclosure Statement

2. The information disclosure statement filed fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but reference JP – 7-6088 referred to therein has not been considered.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 6-7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Omura et al. (USPN: 5,687,347).

Omura discloses a command history information storage means for holding historic information of read commands as information for reading data recorded on a disk memory medium, wherein the read commands are received from a host device (C 7, L 64-67); a continuity detection means for detecting a direction along which prereading of data is to be carried out on the basis of the read commands stored in the command history information (Figure 6, Reference 16, the logic within Reference 16 which sets the displacement value; C 17, L 9-14; C 12, L 24-27); a prereading area decision means for deciding the position [address/block number] and the size [the size of a block] of data to be preread on the disk memory medium on the basis of the read commands and the data prereading direction detected by the continuity detection means (Figure 6, the logic within Reference 16 which sends the prefetch requests to References 12 and 14 indicating the block address; C 13, L 24-61; C 12, L 24-27; inherently the size is known to the system since a block of data is accessed); a buffer memory for holding preread data (Figure 6, Reference 13; C 7, L 28; C 12, L 8-9); a prereading startup means for reading the data to be preread which is decided by the prereading area decision means from the disk memory medium and storing the data in the buffer memory (Figure 6, Reference 12; C 14, L 20-23). Omura does

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not explicitly disclose storing the preread data in a cache memory. However, it is well known in the art to store prefetched [preread] data in a cache memory. This feature is known for providing fast access to data since caches provide fast memory access. Hence, it would have been obvious to one of ordinary skill in the art to use a cache on Omura's system for storing the preread data for the desirable purpose of providing fast memory access.

Additionally with respect to claim 13, all hardware devices are controlled by firmware/device driver's etc and thus it is evident that Omura's comprises a computer readable medium including a program to perform the above functions.

Regarding claim 6, Omura discloses the prereading startup means storing a plurality of preread data which has been read successively out in the backward [reverse] direction successively into a backward direction area in an address space on the cache memory [the area in the cache which stores the data read out in the reverse].

7. Claims 1-3, 6-9, 12-15, 18, 22, 26 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (USPN: 5,345,560).

Regarding claims 1, 7 and 13, Miura discloses a command history information storage means for holding historic information of read commands as information for reading data recorded on a main memory medium, wherein the read commands are received from a host device (Figure 4, Reference 5010; C 4, L 31-33); a continuity detection means for detecting a direction along which prereading of data is to be carried out on the basis of the read commands stored in the command history information (Figure 4, References 5011-5012; C 8, L 41-47); a prereading area

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decision means for deciding the position [address/block number] and the size [the size of a block] of data to be preread on the main memory medium on the basis of the read commands and the data prereading direction detected by the continuity detection means (Figure 4, Reference 501 – Reference 501 provides the requested address to Reference 502 which includes the position of the data and inherently includes the size the system is able to determine the amount of data to preread starting at the position indicated); a buffer memory for holding preread data (Figure 1, Reference 503); a prereading startup means for reading the data to be preread which is decided by the prereading area decision means from the main memory medium and storing the data in the buffer memory (Figure 1, Reference 502; C 4, L 33-40). Miura does not explicitly disclose storing the preread data in a cache memory nor does Miura explicitly disclose prereading from a disk memory. However, it is well known in the art to include a disk memory in a computing system for the desirable purpose of increasing the storage capability of the system [increasing the overall storage space of the system]. It is also well known to preread data from a disk memory and store the preread data in a cache memory for the purpose of reducing latency in the system by providing fast access to data. Hence it would have been obvious to one of ordinary skill in the art to include these features in Miura's system for the desirable purpose of increased storage capabilities and improved performance.

Additionally with respect to claim 13, all hardware devices are controlled by firmware/device driver's etc and thus it is evident that Miura's comprises a computer readable medium including a program to perform the above functions.

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Regarding claims 2, 8 and 14, Miura discloses a command history information storage means for holding historic information of read commands as information for reading data recorded on a main memory medium, wherein the reads commands are received from a host device (Figure 4, Reference 5010; C 4, L 31-33); continuity detection means for detecting an area-to-area distance which is an interval of data to be preread on the basis of the read commands stored in the command history information storage means (Figure 4, References 5011-5012; C 6, L 10-23); a prereading rule holding means for holding prereading rules [forward or backward directional prefetching] for performing prereading of data (Figure 4, Reference 5013; C 6, L 31-34); a prereading rule decision means for deciding a prereading rule to be used for prereading of data on the basis of the read commands, the area-to-area distance detected by the continuity detection means and the prereading rules held by the prereading rule holding means (Figure 4, Reference 501; C 4, L 40-43 - the logic within Reference 501 decides the rule to use for prereading which is output forward/reverse); a buffer memory for storing preread data (Figure 1, Reference 503); a prereading startup means for reading the data to be preread which is decided by the prereading area decision means from the main memory medium and storing the data into the cache memory (Figure 1, Reference 502; C 4, L 33-40). Miura does not explicitly disclose storing the preread data in a cache memory nor does Miura explicitly disclose prereading from a disk memory. However, it is well known in the art to include a disk memory in a computing system for the desirable purpose of increasing the storage capability of the system [increasing the overall storage space of the system]. It is also well known to preread data from a disk memory and store the preread data in a cache memory for the purpose of reducing latency in the system by providing fast access to data. Hence it would have been obvious to one of ordinary skill in the

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art to include these features in Miura's system for the desirable purpose of increased storage capabilities and improved performance.

Additionally with respect to claim 14, all hardware devices are controlled by firmware/device driver's etc and thus it is evident that Miura's comprises a computer readable medium including a program to perform the above functions.

Regarding claims 3, 9 and 15, Miura discloses a command history information storage means for holding historic information of read commands as information for reading data recorded on a main memory medium, wherein the reads commands are received from a host device (Figure 4, Reference 5010; C 4, L 31-33); continuity detection means for detecting a direction along which prereading of data is to be carried out (C 8, L 41-47), and an area-to-area distance which is an interval of data to be preread on the basis of the read commands stored in the command history information storage means (Figure 4, References 5011-5012; C 6, L 10-23); a prereading rule holding means for holding prereading rules [forward or backward directional prefetching] for performing prereading of data (Figure 4, Reference 5013; C 6, L 31-34); a prereading rule decision means for deciding a prereading rule to be used for prereading of data on the basis of the read commands, the area-to-area distance detected by the continuity detection means and the prereading rules held by the prereading rule holding means (Figure 4, Reference 501; C 4, L 40-43 - the logic within Reference 501 decides the rule to use for prereading which is output forward/reverse); a buffer memory for storing preread data (Figure 1, Reference 503); a prereading startup means for reading the data to be preread which is decided by the prereading area decision means from the main memory medium and storing the data into the cache memory

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(Figure 1, Reference 502; C 4, L 33-40). Miura does not explicitly disclose storing the pre-read data in a cache memory nor does Miura explicitly disclose prereading from a disk memory. However, it is well known in the art to include a disk memory in a computing system for the desirable purpose of increasing the storage capability of the system [increasing the overall storage space of the system]. It is also well known to pre-read data from a disk memory and store the pre-read data in a cache memory for the purpose of reducing latency in the system by providing fast access to data. Hence it would have been obvious to one of ordinary skill in the art to include these features in Miura's system for the desirable purpose of increased storage capabilities and improved performance.

Additionally with respect to claim 15, all hardware devices are controlled by firmware/device driver's etc and thus it is evident that Miura's comprises a computer readable medium including a program to perform the above functions.

Regarding claims 6, 12, 18, 22, 26 and 30, Miura discloses the prereading startup means storing a plurality of pre-read data which has been read successively out in the backward [reverse] direction successively into a backward direction area in an address space on the cache memory [the area in the cache which stores the data read out in the reverse].

Allowable Subject Matter

8. Claims 4-5, 10-11, 16-17, 19-21, 23-25, and 27-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Conclusion

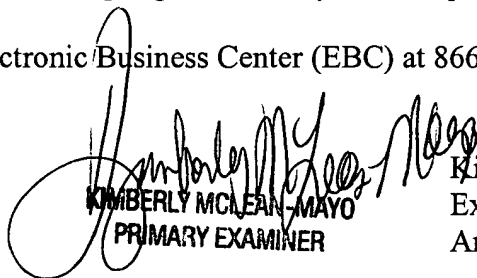
9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gornish – USPN: 5,752,037 – forward and reverse prefetching.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly N. McLean-Mayo whose telephone number is 703-308-9592. The examiner can normally be reached on M-F (9:00 - 6:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on 703-308-1756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



KIMBERLY MCLEAN-MAYO
PRIMARY EXAMINER

Kimberly N. McLean-Mayo
Examiner
Art Unit 2187

KNM

April 10, 2004